MSC Guidelines for Review of Inland Tank Barge Structures and Longitudinal Strength

Procedure Number: T1-12 Revision Date: 11/29/99

References

a. 1997 ABS Rules for Building and Classing Steel Vessel for Service on Rivers and Intracoastal Waterways
b. 46 CFR Subchapter D
c. 46 CFR Subchapter I
d. 46 CFR Subchapter O
e. NVIC 1-98, Loading Considerations for Existing Inland Tank Barge

Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy guidance. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Transportation expressly disclaim liability resulting from the use of this document.

Contact Information

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General Review Guidance

- If the vessel is new and not a sister vessel, has the Application for Inspection been submitted? In general, no plan review will occur until receipt of a copy of the Application.
- Is it clearly stated what is desired from the MSC? Are all plans requiring Coast Guard review and/or approval submitted in triplicate? Are there any special or unusual requests involved?

- Is the vessel being reviewed under NVIC 10-82? If yes, then MSC review of structure and longitudinal strength is not required. Note: under NVIC 10-82, the MSC must review and approve general arrangement plans.

- Is the vessel being classed by ABS? If yes, check the vessel file for ABS letter/drawings or request from submitter/ABS. As stated in 46 CFR 31.10-1(c), CG considers ABS structural review for class as acceptable for showing compliance with US structural regulations.

- Check to see if the vessel is regulated under 46 CFR Subchapter D and has the following characteristics:
  - Registered length between 175 and 300 feet
  - Integral cargo tanks; single or double hull; flush or raised-trunk decks
  - Designed and constructed in accordance with reference (a) or similar standards, and
  - Subject to "abnormal" midship bending stresses (see definition)

  If the vessel has these characteristics, then all owners and operators of tank barges are advised to conduct a structural evaluation, in accordance with reference (e). If this has been submitted, then the MSC will review the calculations in accordance with reference (e).

  Note: Reference (e) is for guidance only and Coast Guard review and approval of strength calculations and cargo load configurations is not mandatory.

- Per 46 CFR 31.10-32, if the barge is constructed after September 6, 1977 and is greater than 300 feet in length, a loading manual must be submitted in accordance with 46 CFR 42.15-1(a) or 45.105(a). Review of this item is normally conducted as part of the final stability review.

- Ensure the following drawings (items) are submitted:
  - General Arrangements
  - Scantling plans, including deck bin scantling
  - Structures calculations

- Verify that the hull, structural bulkheads, and decks are constructed of steel.

Note: Use reference (a), ABS Rules for all Part __Section __ requirements, as listed below:

- For unclassed vessels,
  - Calculate the vessel definitions: Part 3/Section 1.
  - Calculate the tank head for scantlings: Part 3/3.12
  - Calculate and check the construction of tank bulkheads: Part 3/3.13.2
  - Calculate and check side shell and bottom plating: Part 3/3.15
  - Calculate and check deck plating: Part 3/3.5
  - Verify the structural arrangement: Part 3/3.3
  - Calculate and check the construction of watertight bulkheads: Part3/3.13.3
  - Check bulkhead arrangement: Part 3/3.13
  - Check truss scantlings: Part 3/3.9
  - Check web frame, girder, and stringer scantlings: Part 3/3.11
  - Verify hatch and fitting requirements: Part 3/3.17

- For unclassed vessels carrying pollution category I oil cargo as listed in 46 CFR Table 30.25-1,
  - Calculate the vessel definitions: Part 3/Section 1.
  - Calculate the tank head for scantlings: Part 3/3.12
  - Check and validate the minimum midship SM: 46 CFR 32.59-1(c)
  - Calculate and check the construction of watertight bulkheads: Part3/3.13.3
  - Calculate and check the construction of tank bulkheads: Part 3/3.13.2
  - Calculate and check side shell and bottom plating: 46 CFR 32.59-1(e)(5)-(8)
  - Calculate and check deck plating: 46 CFR 32.59-1(e)(1)-(3)
  - Check scantlings for longitudinal stiffeners within 40% of midship length: 46 CFR 32.59-1(d)
  - Calculate and check the construction of watertight bulkheads: Part3/3.13.3
  - Check bulkhead arrangement: Part 3/3.13

- For Type I and II, Subchapter O barges,
  - Verify compliance with the pinnacle grounding requirement: 46 CFR 151.10-20(b)

- For all vessels,
  - Create a complete HECSALV model, including structural details. Analyze and verify longitudinal strength requirements.

Definition

Abnormal bending stresses: Those stresses caused by extreme distribution of cargo, such as loaded midship tanks with empty end tanks. This includes intermediate conditions of loading or discharging, even at terminals in calm water conditions. However, it does not include barges which are slightly trimmed to facilitate cargo operations. The stresses can also be wave-induced. The Coast Guard has traditionally allowed tank barges designed and constructed to ABS River Rules to operate on LBS and near-coastal routes. However, the wave-induced stresses encountered on some of these exposed or partially-exposed waters may be beyond that intended by the ABS River Rules. Therefore, operation in these waters, regardless of loading practices, may warrant a structural evaluation.